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| 10/537,856  | 06/07/2005  | Martin S. Wilcox     | GB02 0217 US        | 7210             |
| 24738 7590 04/04/2008<br>PHILIPS ELECTRONICS NORTH AMERICA CORPORATION<br>INTELLECTUAL PROPERTY & STANDARDS<br>370 W. TRIMBLE ROAD MS 91/MG<br>SAN JOSE, CA 95131 |             |                      |                     |                  |
| EXAMINER<br>CHEN, SHELLEY   |             |                      |                     |                  |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/537,856

**Applicant(s)**

WILCOX, MARTIN S.

**Examiner**

SHELLEY CHEN

**Art Unit**

3661

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 October 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments filed 24 October 2007 have been fully considered but are not persuasive.
2. The applicant argues on page 8 that Fuchter merely describes the use of "two pulse trains having different pulse repetition frequencies", and that Fuchter fails to disclose that the first and second codes are of unequal duration.

This argument is not persuasive because the pulse repetition frequency is inversely proportional to the duration between successive pulses. Thus if the two pulse trains have different pulse repetition frequencies, the code durations must also be unequal (where the code may be considered a binary code of a single high pulse followed by a series of low non-pulses corresponding to the interval between pulses, or the code may be considered a counting sequence of integers with an integer for each fixed unit of time between pulses as shown in figure 1).

3. The applicant argues on page 9 that neither Fuchter nor Low discloses "transmitting a signal comprising simultaneous first and second components".

However, Low writes that "The difficulties experienced in the use of prior art ranging systems are overcome by the present invention wherein signal degradation due

to power sharing among simultaneously transmitted individual code sequences, or components, is compensated for by transiting the individual components sequentially" (column 2 lines 36-41). Thus Low discloses both simultaneous and sequential transmission embodiments. Although Low chooses sequential transmission for his invention, he teaches that simultaneous transmission is known in the prior art. Therefore it would have been obvious at the time of the invention to modify Fuchter to use simultaneous (rather than sequential) transmission, as taught by Low and well known in the art.

### ***Specification***

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Method and Apparatus for Measuring Distance Using Dual-Component Radar.

5. The disclosure is objected to because of the following informalities: Section headings are missing from the specification.

Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. **Claims 5-14 rejected** under 35 U.S.C. 103(a) as being unpatentable over **Fuchter et al.** (U.S. Patent # 5,796,364) in view of **Low et al.** (U.S. Patent 3,659,292).

**Regarding claims 5, 7, 9-10, and 12**, Fuchter clearly shows and discloses the claimed invention except that his invention transmits the first and second codes sequentially instead of simultaneously. Fuchter discloses a radar system that determines range (column 1 lines 31-47) by transmitting and receiving two periodic codes of unequal duration (column 1 lines 12-17, column 2 lines 9-14), as shown in the figure. A receiver detects the codes and generates a distance measurement for each code, which are then combined into a third distance calculation (column 1 lines 59-64) if

the individual distance measurements are reasonably close (column 6 lines 46-59, discusses velocity but also applies to distance).

In the same field of endeavor, Low discloses another sequential radar ranging system that compares a series of code transmissions to determine distance. However, Low discloses that simultaneous code sequence transmission is common in the prior art (column 2 lines 36-41), but ultimately chooses to use sequential transmission to reduce signal degradation due to power sharing over long distances (such as between a ground station and an extraterrestrial probe, see abstract). The signal degradation would not be so serious over the (likely) shorter distances of Fuchter's ranging system. See also the abstract (basics), column 2 lines 3-5 (relatively prime code periods in prior art), column 3 lines 11-24 (more basics), and table 3 (18 possible code components and resulting range ambiguity resolving power). Thus Low teaches all of the additional limitations introduced by claims 1, 3, 5, 7, 9-10, and 12.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to modify Fuchter's ranging system to transmit the code sequences simultaneously, as taught by Low and many others.

Doing so would decrease the time required to make a range measurement, thus allowing more frequent range updates. This is especially useful for close-range or fast-moving targets.

**Regarding claim 6** as applied to claim 5 above, **claim 11** as applied to claim 10 above, **and claim 13** as applied to claim 12 above, Fuchter further discloses that the

respective durations of the first and second codes are proportional to respective numbers having a relative prime relationship, as discussed in column 7 lines 20-24. (See figure and column 2 lines 27-33 for background). See also Low column 2 lines 3-5 (relatively prime code periods in prior art).

**Regarding claim 8** as applied to claim 5 above, Fuchter fails to disclose any information about the time of flight of the signals. However, Low discloses that at least one of the first and second indications of distance is an indication of time of flight of the signal, as discussed in column 9 lines 50-64, "...A round-trip time-of-flight estimate for the transmitted signals is also required [as a computer input to calculate range] ". Thus Low teaches all of the additional limitations introduced by claims 4 and 8.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to modify Fuchter's ranging system so that at least one of the first and second indications of distance is an indication of time of flight of the signal, as taught by Low.

Doing so would permit easy calculation of the distance by use of the relationship between the distance and the time of flight and velocity of the signals.

8. **Claims 1-4 rejected** under 35 U.S.C. 103(a) as being unpatentable over **Fuchter et al.** (U.S. Patent # 5,796,364) in view of **Low et al.** (U.S. Patent 3,659,292) and further in view of **Sallen et al.** (U.S. Patent # 5,661,460).

**Regarding claims 1 and 3**, see the rejection for claims 5 and 7 above.

Fuchter as modified by Low discloses all limitations of the instant claims, except for initiating an alarm if the third indication of *the distance is above a predetermined threshold value*.

In the same field of endeavor, Sallen discloses a method of determining a distance between a first device and a second device, including initiating an alarm if the distance is above a predetermined threshold value. (column 3 lines 4-7) It would have been obvious to do so in order to enable a parent to monitor the proximity of a child (column 3 lines 4-7), with predictable results.

**Regarding claim 2**, see the rejection for claim 6 above.

**Regarding claim 4**, see the rejection for claim 8 above.

9. **Claim 14 rejected** under 35 U.S.C. 103(a) as being unpatentable over **Fuchter et al.** (U.S. Patent # 5,796,364) in view of **Low et al.** (U.S. Patent 3,659,292) as applied to claim 12 above, and further in view of **Richards et al.** (U.S. Patent # 6,295,019).

**Regarding claim 14** as applied to claim 12 above, Fuchter's invention, as modified by Low, clearly shows and discloses all of the limitations of the instant invention except that their ranging system does not multiply the first and second code components by an in-phase and quadrature oscillator signal, and then sum the resulting



products during the generation/transmission step. However, this is a common method (quadrature phase shift keying) to simultaneously transmit two binary signals.

In one embodiment of Low's invention, a returned code sequence and a reference code sequence are received simultaneously at a ranging receiver (46 on figures 1 and 3) as shown in figures 3 and 5. The first and second block of figure 5 show a case where the codes were modulated onto in-phase and quadrature signals as in the instant claim. See also column 6 lines 15-29 (ranging receiver code inputs are 90 degrees out of phase) and column 11 lines 33-37 (output on in-phase and quadrature leads).

Low also discloses that the transmitter (10) modulates the phase of an oscillator by the code sequence using the transmitter coder (20) and phase modulator (24) of figure 1 and that "Any conventional form of modulation can be used" (See column 4 lines 56-66). Thus Low teaches all of the additional limitations introduced by claim 14.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Fuchter's invention to transmit the two pulse codes under quadrature phase shift key modulation rather than directly as a pulse train, as taught by Low.

Doing so would permit the two binary signals to be transmitted simultaneously without loss of information due to interference.

See also Richards et al. (U.S Patent # 6,295,019) regarding claims 3-4, 7-8, and 14, particularly the abstract.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shelley Chen whose telephone number is (571) 270-1330. The examiner can normally be reached Mondays through Fridays, between 10:00 AM and 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Black can be reached at (571) 272-6956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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